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On the Fern Genus *Pyrrosia* Mirbel (Polypodiaceae) in Asia and Adjacent Oceania (2)

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In this second part of the paper, an enumeration of the species from No. 23 to 64 is prepared. Two new species are described in this part.

23. **Pyrrosia penangiana** (Hook.) Holtt., Ferns Mal. 146. f. 62 (1955); Hovenk., Monogr. *Pyrrosia* 218. f. 18 (1986); Tagawa & K. Iwats., Fl. Thail. **3**: 503 (1989) – *Niphobolus penangianum* Hooker, Ic. Pl. **3**: ad t. 203 (1840).

Niphobolus mollis Kunze in Bot. Zeit. **1848**: 121 – *Pyrrosia mollis* (Kunze) Ching in Bull. Chin. Bot. Soc. **1**: 53 (1935) et auct. Asia q.n.s.

Cyclophorus brevipes v.A.v.R. in Bull. Jard. Bot. Buitenz. III **2**: 139 (1920).

Specimens examined. Nepal: Namba et al. 154 (KYO). Thailand: E. Smith 2012, 2013, 2598, 2606 (K). Malaya: M.-Allen 3912 (SING), Henderson 19447, 22238, 25239 (PE, SING), Shimizu et al. 14353 (KYO). Sumatra: Alston 13741 (BO), Borssum 1729 (BO), Hancock 89 (PE), 1892 (K), Lörzing 11926, 16937 (BO), de Wilde 12527 (BO). Java: Backer 4861 (BO), von Leeuwen 290 (BO), Posthumus 1808, 4026 (BO), Raciborski s.n. (BO). Flores: Schultz 3682 (BO). Lombok: Posthumus 1598 (BO), Rensch 128 (BO). Sumbawa: Kuswata 255 (BO), Rensch 677 (BO). Timor: Jaag 989 (BO), Schmutz 2230 (BO), Teysman 16420 (BO).

Habitat: On tree trunks or on rocks at low elevations, or up to 1500 m altitude in Java.

Lectotype of *Niphobolus mollis* Kunze was typified by Ching as Zollinger 3183. Hovenkamp examined the lectotype specimen carefully and concluded that Zollinger 3183 is a mixture of some species including *P. penangiana* (K and BM) and only one specimen in BM (Zollinger 3761) represents *P. porosa* in the sense of this paper. *Pyrrosia mollis* is thus a synonym of this species as pointed out by Hovenkamp (1986).

Rhizome short creeping; scales lanceolate, long-acuminate at apex, entire; laminae oblanceolate, widest at above the middle portion, gradually narrowing towards almost sessile base, thin and fleshy in texture; induments monomorphic; upper surface of laminae glabrous, puncticulate, lower surface covered with only one layer of stellate hairs with aciculate rays; sori usually restricted near apex or on upper 1/3 of laminae.

24. **Pyrrosia gralla** (Gies.) Ching in Bull. Chin. Bot. Soc. **1**: 50 (1935); Tagawa in J. Jpn. Bot. **24**: 118 (1949); Shing, Icon. Corm. Sin. **1**: 267 (1972), Vasc. Pl. Hengduan Mts. **1**: 170 (1993); Tsai & Shieh, Fl. Taiwan 2nd ed. **1**: 514 (1994) – *Niphobolus gralla* Gies., Farng. Niph. 228 (1901).

Cyclophorus transmorissonensis Hayata, Icon. Pl. Formos. **4**: 256. f. 180 (1914) – *Pyrrosia transmorissonensis* (Hayata) Ching in Bull. Chin. Bot. Soc. **1**: 72 (1935); Kuo in Taiwania **30**: 43 (1985); Tsai & Shieh, Fl. Taiwan 2nd ed. **1**: 516 (1994).

Cyclophorus subfissus Hayata, Icon. Pl.

Formos. **5**: 264 (1915).

Cyclophorus matsudai Hayata, Icon. Pl. Formos. **10**: 73. f. 48 (1921) – *Pyrrosia matsudai* (Hayata) Tagawa in J. Jpn. Bot. **24**: 119 (1949); Kuo in Taiwania **30**: 43 (1985); Tsai & Shieh, Fl. Taiwan 2nd ed. **1**: 515 (1994).

Pyrrosia porosa Hovenk., Monogr. *Pyrrosia* 225 (1986), p.p.

Pyrrosia mollis (Kunze) Ching: sensu DeVol, Fl. Taiwan **1**: 207 (1975).

Chinese name: 西南石苇

Specimens examined. China. Yunnan: W.M. Chu 1621, 1774 (PE), K.M. Feng 2490, 3488 (PE), Henry 9061A (type of *P. gralla*, PE), Y. Jiang 16529 (PE), T.N. Liau 13640 (PE), B.Y. Qiu 54440, 54535, 771027 (PE), H.G. Zhou & P. Sun 14375 (PE); Sichuan: Q.H. Cheng 4532 (PE), T.L. Dai 106835 (PE), Y.Q. He 1745 (PE), K. Huang et al. 679 (PE), S. Jiang 645, 9017 (PE), X.L. Jiang 35838 (PE), X.X. Kong 3549 (PE), X. Li 71219, 73612, 76241, 76511 (PE), S. Lu 2444 (PE), Rosthon 1710 (PE), H. Smith 13336 (K, PE), Z.P. Song 39304 (PE), T.P. Yi 74438 (PE), D.H. Zhang 1372 (PE), S.S. Zhang 6720 (PE), H.C. Zhou 14219 (PE), H.F. Zhou 110932 (PE); Taiwan: Hayata s.n. (type of *Cyclophorus subfissus*, TI), Kawakami & Mori 2363 (type of *Cyclophorus transmorissonensis*, TI), Suzuki St. 20626 (TI), Tagawa 372, 762, 1874, 3023, 3259, 3718, 3728 (KYO, MICH), Tamura et al. 20627 (KYO).

Habitat: Epilithic often on rocks in forests at 960–2700 m altitude.

This species is different from *P. porosa* in only one layer of stellate hairs with light brown, aciculate rays, the leaves with long subglabrous stipes, laminae elliptic-lanceolate, narrowed towards both ends, never enrolled, and with thinner texture. *Pyrrosia transmorrisonensis* was combined with *P. mollis* by DeVol in Flora of Taiwan. Based on the type and other Taiwan collections identified as this species, it is observed that they have only one layer of stellate hairs with aciculate rays and are identical with *P. gralla*. The type of *P. matsudai* (Y. Matsuda s.n., July 1919, Takao Prov., Taiwan, photo, hastate at base, but M. Inada s.n., Mutai in 1940 and T. Suzuki 30626, TI, are not hastate at base) has only one layer of stellate hairs with nearly aciculate rays and someone has empty sporangia; it may be a hybrid.

25. **Pyrrosia davidii** (Bak.) Ching in Acta Phytotax. Sin. **10**: 301 (1965); Shing, Ic. Corm. Sin. **1**: 267. f. 534 (1972); Kurata & Nakaike, Ill. Pterid. Jap. **2**: 592 (1991); K. Iwats., Ferns F. Allies Jap. 263. pl. 179-5 (1992); Nakaike, New Fl. Jap. 699 (1992) – *Polypodium davidii* Baker in Ann. Bot. **5**: 472 (1891).

Cyclophorus pekinensis C. Chr., Ind. Fil. 200 (1906) – *Pyrrosia pekinensis* (C. Chr.) Ching in Bull. Chin. Bot. Soc. **1**: 51 (1935).

Pyrrosia porosa (Pr.) Hovenk. var. *porosa*; Hovenk., Monogr. *Pyrrosia* 226 (1986), p.p.

Chinese name: 華北石苇

Japanese name: イワダレヒトツバ

Specimens examined. China. Common in North, Northwest and Central China, northwards to Liaoning, Inner Mongolia, eastwards to Shandong, southwards to Hunan. Representative collections are: Liaoning: Li et al. 176 (PE); Yang et al. 698 (PE); Shandong: Hokinson 1729 (PE), Y.C. Wang 473 (PE); Inner Mongolia: W. Wang et al. 3097, 3276 (PE); Hebei: T.F. King 87 (PE), K.M. Liu 3065 (PE), S.E. Liu 4658 (PE), G. Sato 10160 (PE), S.W. Wang 62536 (PE); Shaanxi: K.S. Hao 4058 (PE), W.Y. Hsia 4322 (PE), T.P. Wang 1539 (PE); Gansu: Licent 5036 (PE), T.P. Wang 15089 (PE); Honan: L.H. Liu 1820 (PE), C.X. Shi 1940 (PE); Hubei: H.C. Chow 265 (PE), T.P. Wang 12033 (PE); Jehol: Nakai et al. 305, 307, 310, 316–318 (TI).

Habitat: Epilithic on rocks at 200–2000 m altitude.

This resembles the preceding species, but different from it in: plants smaller, fronds thinner in texture, stellate hairs shorter and appressed. These two seem to be geographic races of a species. There are specimens with empty sporangia, and some sporangia contain only 32 spores; *P.* × *nipponica* Beppu & Serizawa in J. Phytogeogr. Tax. **30**: 45–47 (1983) may be in China and need to be revised.

26. **Pyrrosia shennongensis** Shing, sp. nov.

Species critica habitu *P. fengii* proxime similis differt, laminis tenuioribus, indumento

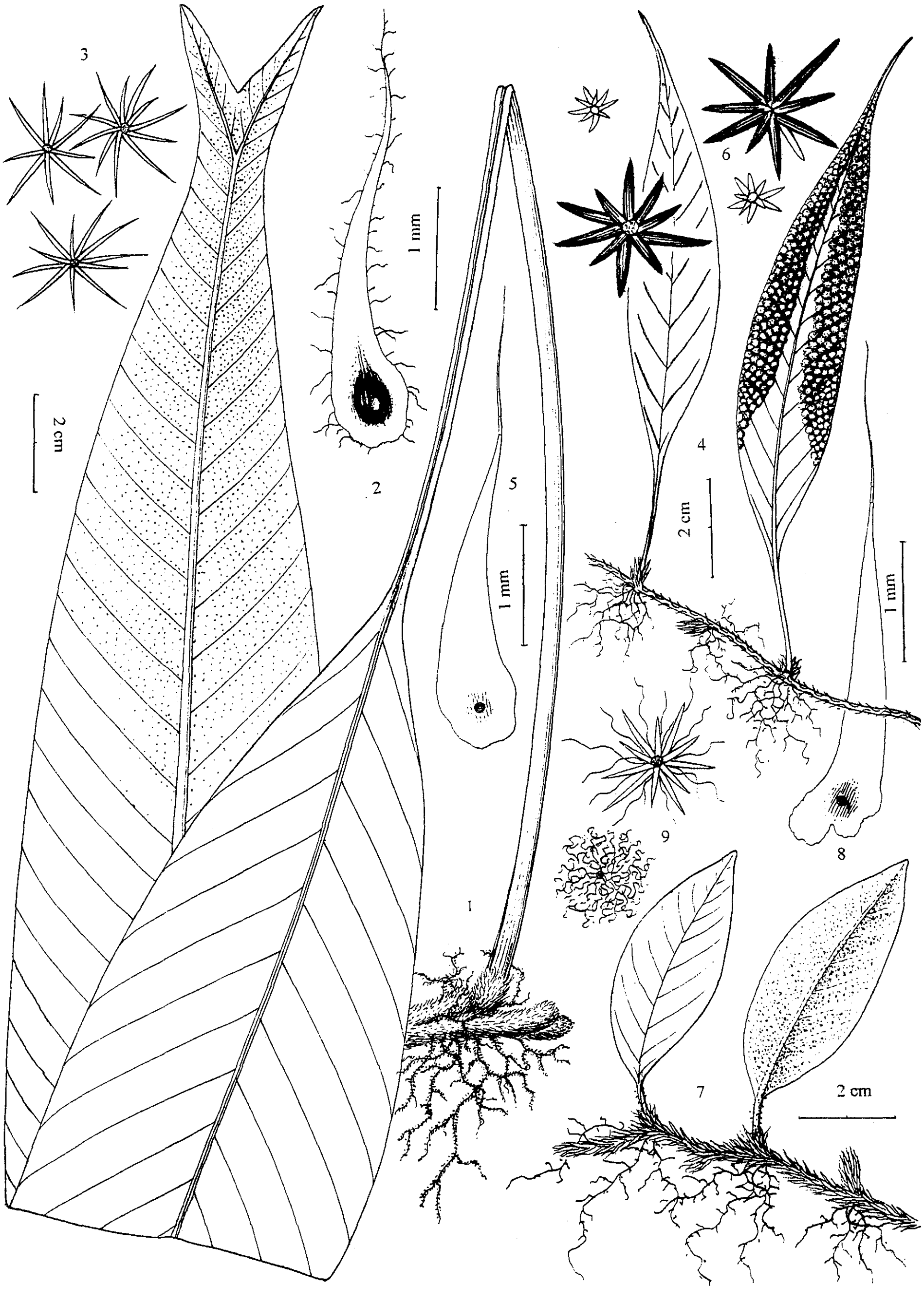

Fig. 1. 1–3. *Pyrrosia shennongensis*: 1. Plant × 1, 2. Scale × 25, 3. Stellate hairs (enlarged); 4–6. *Pyrrosia ensata*: 4. Plant × 1, 5. Scale × 25, 6. Stellate hairs (enlarged); 7–9. *Pyrrosia fuohaiensis*: 7. Plant × 1, 8. Scale × 25, 9. Stellate hairs (enlarged) (Drawer: Ji Chao-Zgen).

unistrati, stellato-pillosis cum lanceolati-radiis. A *P. pseudocalvata* laminis late elliptico-lanceolatis, basi cunneatis, non decurrentis, nervis lateralibus utrinque manifestis, inferne ravidis, indumento tenuioribus.

Chinese name: 神衣石韦

China. Hubei: Shennongjia, Tagouwan, Hubei Shennongjia Exped. 20447 (type, PE), on rocks at elevation about 1000 m. altitude.

This new species is similar to *P. fengii* especially in its outline, though the induments are thinner, stellate hairs are grey with only one cell layer of lanceolate rays. This is again something similar to *P. pseudocalvata*, though laminae are broader, elliptic-lanceolate, cuneate at base, softly chartaceous in texture and not rigid coriaceous.

27. **Pyrrosia heteractis** (Mett. ex Kuhn) Ching, Bull. Chin. Bot. Soc. **1**: 57 (1935); Tagawa in Hara, Fl. East. Himal. 2nd Rep. 219 (1971); Satija & Bir, Polypod. Ferns Ind. 42 (1985); Ching & S.K. Wu, Fl. Xizang. **1**: 337 (1983); Tagawa & K. Iwats., Fl. Thail. **3**: 506. f. 50, 11–12 (1989) – *Polypodium heteractis* Mett. ex Kuhn, Linnaea **36**: 140 (1869) – *Pyrrosia lingua* (Thunb.) Farw. var. *heteractis* (Mett. ex Kuhn) Hovenk. in Blumea **30**: 208 (1984), Monogr. *Pyrrosia* 206 (1986).

Pyrrosia heteractis var. *minor* (*Cyclophorus* C. Chr.) Ching in Bull. Chin. Bot. Soc. **1**: 58 (1935); Tagawa & K. Iwats., Fl. Thail. **3**: 507 (1989).

Chinese name: 紙質石韦

Specimens examined. China. Sichuan: T.P. Yi 75010 (PE); Yunnan: J. Cheng 1071 (KUN), Ching 25433, 50758 (PE), K.M. Feng 4465, 7029, 7314, 8015, 13730, 22079 (KUN), Forrest 20201, 26697 (K), T.N. Liou 18619, 22434 (PE), H.T. Tsai 54297 (PE), C.W. Wang 67112, 78407 (type of *P. martinii* var. *rotundobasis* Ching in herb. PE), Z.R. Wang 761 (PE), S.K. Wu 4157 (type of *P. subheteractis* Ching in herb. KUN, PE), 7320 (KUN), T.T. Yü 20188, 20545 (KUN); Guangxi: W.T. Tsang 24498 (PE); Xizang: Li & Chen 82–2133, 83–3721 (PE), T.P. Yi 79164 (PE); Hainan: W.T. Tsang 678 (BO). Bhutan: Kanai et al. 7141, 7341, 13271 (TI). Nepal: Fleming 1711, 2161, 2162 (K), Hara et al. 6302041–44, 6329241 (TI). Burma: Dickason 329, 356, 373, 6713 (US), Rock 7491 (US). India: Chand 2138, 3296 (K), Hara & Togashi 2148 (TI), Kanai et al. 725832 (TI), Koilz 23202, 26897, 29499, 30156 (K), G. Mann s.n. (K), Simons s.n. (BO), Togashi 2131 (TI). Sikkim: Hara et al. 2133 (TI). Thailand: Iwatsuki et al. 8443 (KYO), Tagawa et al. 4670, 4779 (KYO). Vietnam: Hayata 132, 288 (TI), Pételot 3736 (P).

Habitat: Usually on rocks in forests or on tree trunks at 1000–2600 m altitude.

In appearance it is similar to a broad form of *P. lingua* in outline, though the induments are dimorphic: the lower layer of stellate hairs with rays of two kinds, or mixed with (1–)2–3(–5) frizzy wooly rays among the lanceolate rays; the upper layer only sparsely covered with some dark brown stellate hairs with short lanceolate rays. The laminae are oblong, with caudate apex and thinner texture and always growing in forests.

28. **Pyrrosia eberhardtii** (Christ) Ching in Bull. Chin. Bot. Soc. **1**: 59 (1935); Tard.-Blot & C. Chr., Fl. Gén. Indo-Chine **7**(2): 507 (1941); Ching et al., Fl. Hainan **1**: 188 (1964); Tagawa & K. Iwats., Fl. Thail. **3**: 505. f. 50, 9–10 (1989) – *Cyclophorus eberhardtii* Christ in J. Bot. Paris **21**: 237, 270 (1918).

Cyclophorus lingua Merr. in Lingn. Sci. J. **5**: 19 (1927).

Pyrrosia lingua (Thunb.) Farw. var. *heteractis* (Mett. ex Kuhn) Hovenk. in Blumea **30**: 208 (1984), Monogr. *Pyrrosia* 206 (1986), p.p.

Chinese name: 琼岩石韦

Specimens examined. China. Hainan: S.K. Lau 3114 (PE), H.Y. Liang 62567, 62705, 65113 (PE), F.C. How & N.K. Chun 70188 (PE), N.K. Chun & C.L. Tso 43987, 44160 (PE), Shing et al. 1668, 1684 (PE), W.T. Tsang 678 (PE), C. Wang 34416, 35375 (PE); Guangdong: W.T. Tsang 17427 (PE). Vietnam: Eberhardt 1341 (P), Fleury 29, 890 (P). Thailand: Iwatsuki et al. 8373 (KYO), Murata et al. 15728 (KYO), Tagawa et al. 632, 1323, 4670, 4779 (KYO), Yoda 480 (KYO).

Habitat: Epiphytic on tree trunks at altitude of up to 1650 m.

This species is distinct from *P. heteractis*

(Thunb.) Ching in stipes longer than laminae and dense, greyish, stellate hairs; laminae oblong, round-obtuse at apex, thickly coriaceous in texture, glabrous and without punctures on upper surface. The stellate hairs are in one layer similar to *P. heteractis* with two kinds of rays, never covered with dark brown stellate hairs. Sori are hidden by dense induments. Distribution area is another distinct point of this species from *P. heteractis*.

29. **Pyrrosia fuohaiensis** Ching & Shing, sp. nov. (Fig. 1, 7–9)

Species indumenti arcte affinis *P. heteracti* (Mett. ex Kuhn) Ching, differt minore usque 5–7 cm alta, paleis integris, subulate lanceolatis, stipitibus laminis 3–5 pro brevioribus, laminis oblongis, obtuse acutis lateralibus nervis in utroque manifestis.

Chinese name: 佛海石苇

China. Yunnan: C.W. Wang 73616 (type, PE), on tree trunks in mixed forests at about 1530 m alt.

This is similar to *P. heteractis* in induments, but the plants are smaller, 3–5 cm tall, with short stipes 1/3–1/5 as long as laminae; laminae oblong, obtuse-acute; rhizome scales subulate, lanceolate, entire.

Hovenkamp (1986) cited Wang 73616 in his notes under var. *heteractis* and considered that rhizome scales are entire throughout with deciduous cilia; actually the specimen of this number in PE is completely long linear-caudate and never has any deciduous tracks.

30. **Pyrrosia costata** (Pr.) Tagawa & K. Iwats. in Acta Phytotax. Geobot. **22**: 100 (1967), Fl. Thail. **3**: 505 (1989); K. Iwats. in Acta Phytotax. Geobot. **25**: 71, 75 (1972); Shing in Amer. Fern J. **73**: 76 (1983); Hovenk., Monogr. *Pyrrosia* 171. f. 17 (1986) – *Niphobolus costatus* Wall. ex Presl, Tent. Pterid. 200 (1836).

Niphobolus beddomeanus Gies., Farng. Niph. 101 (1901) – *Pyrrosia beddomeana* (Gies.) Ching in Bull. Chin. Bot. Soc. **1**: 68 (1935), nom. superfl.

Niphobolus beddomeanus Gies. f. *fallax* Gies., Farng. Niph. 103 (1901).

Polypodium stigmosum & syn. homot., auct. non Swartz: Baker in Hook. & Bak., Syn. Fil. 350 (1867); Clarke in Trans. Linn. Soc. II Bot. **1**: 553 (1880); Bedd., Handb. 329 (1892); Wu et al. in Bull. Dept. Biol. Sun Yatsen Univ. **3**: 340. pl. 161 (1932); Ching & S.K. Wu, Fl. Xizang. **1**: 337 (1983).

Chinese name: 下延石苇

Specimens examined. China. Yunnan: W.M. Chu et al. 15549 (PE, PYU), M.K. Li 1495 (KUN, PE), Y.H. Li 11586, 11963, 11966 (KUN), Rock 7703 (US), C.W. Wang 67587 (PE), S.K. Wu 8609 (KUN); Xizang: B.S. Li & S.Z. Chen 3976 (PE). Nepal: Fleming 1256, 2158 (K, MICH), Hara et al. 308, 26061 (TI), Kanai et al. 725033, 725050, 725430, 725847 (TI), Ohashi et al. 774594, 774653 (TI), Ohba et al. 8350085 (TI), Gay Troth 72 (K, NY). Sikkim: Clarke 6459 (K); India: G. Mann s.n. (BO, K), Simons s.n. (BO), Koelz 24726, 27723 (K). Burma: Dickason 762 (GH). Thailand: Iwatsuki et al. T 7510, T 11031 (KYO). Malaya: Kokawa et al. 1362 (KYO). Borneo: H.F. Sun 6793 (PE).

Habitat: On tree trunks or on rocks in forests at altitude of up to 2000 m.

Hovenkamp (1984) described a new species, *Pyrrosia platyphylla*, from Borneo based on the materials ever named as *P. costata*. He distinguished it from *P. costata* as: rhizome shortly elongate but not creeping; scales more or less abruptly narrowed upwards; costae having a central bundle with collenchyma, distinctly keeled when dried up, not quadrangular; upper epidermis with distinctly thick walls, hypodermis present. Combination of these characters is not seen in the materials from other localities.

31. **Pyrrosia princeps** (Mett.) Morton in Amer. Fern J. **60**: 118 (1970); Hovenk., Monogr. *Pyrrosia* 231. f. 17, 37 (1986) – *Polypodium princeps* Mett. in Ann. Mus. Lugd. Bat. **2**: 232 (1866).

Chinese name: 顕脈石苇

Specimens examined. China. Yunnan: W.M. Chu et al. 15110 (PE); Xizang: S.Z. Chen & B.S. Li 1708, 2351, 3297, 3976 (PE). Indonesia. Sulawesi: Hennipman 5036 (BO); Ambon: Brooks 17752 (BO), Rant 536 (BO), Robinson 1979 (BO); Ceram: Kato et al. 411, 420, 1627, 4792, and many others (TI), Rutten 341, 1769, 2008 (BO), Treub s.n. (BO); Bacan: Ramlento 934 (BO); Halmahera: Idjun & Moohtur 180, 350 (BO); New Guinea: Brass 3556, 5492, 8859, 23703 (B, NY), Carr 12396, 74682 (B, NY), Clemens 10485 (GH), Grelher et al. 4220 (US), Pleyte 530 (BO), Schlechter 16377 (B, PE).

Habitat: Epilithic on rocks in forests or in thickets at 1100–2400 m altitude.

Larger plants; rhizome short ascending, scales basifixed, subulate lanceolate, acuminate at apex, subserrate, brown, hard; fronds oblanceolate, obtuse-acute at apex, cuneate and decurrent downwardly, sometimes over 100 cm long, 4–9 cm wide, widest at above the middle portion; stipes covered with dense wooly stellate hairs; upper surface of laminae glabrous, puncticulate; induments on lower surface trimorphic, superficial layer with sparse hairs, bearing aciculate rays sometimes with long and dark brown dorsal spines at central portion, the next layer with narrowly lanceolate and wooly rays; lateral veins distinct; sporangia sessile.

32. **Pyrrosia flocculosa** (D. Don) Ching in Bull. Chin. Bot. Soc. **1**: 66 (1935); C. Chr. & Tard.-Blot in Not. Syst. **8**: 205 (1939); Tard.-Blot & C. Chr., Fl. Gén. Indo-Chine **7**(2): 512 (1941); Nayar in J. Ind. Bot. Soc. **40**: 164 (1961); Tagawa in Hara, Fl. East. Himal. 498 (1966), 2nd Rep. 257 (1973); Tagawa & K. Iwats. in Acta Phytotax. Geobot. **24**: 61 (1969), Fl. Thail. **3**: 503 (1989); Nayar & Kaur, Comp. Bedd. Handb. 81 (1974); Hovenk., Monogr. *Pyrrosia* 179. f. 19 (1986) – *Poypodium flocculosum* D. Don, Prodr. Fl. Nepal. 1 (1825).

Chinese name: 卷毛石苇

Specimens examined. China. Guangxi: S.Q. Cheng 13025 (IBSC, KUN, PE); Yunnan: W.M. Chu 6004 (PE, PYU), C.W. Wang 86305 (KUN, PE). Bhutan: H. Hara et al. 2075, 2096 (TI). Nepal: Fleming 1744 (K, MICH), Hara et al. 6300154, 6302036–6302040, 8311183, 8350195, 8350454 (TI), Kanai et al. 725396 (TI), Ohashi et al. 773272 (TI), Tabata et al. 10980 (KYO, PE). Sikkim: Clarke 13135 (BO, K), Hara 2128–30 (TI), Kihara & Nakao s.n. (KYO). Burma: Dickason F170 (GH), Rock 7490 (US). India: Fleming 3A, 120A, 303 (K), Steward 2077, 12350 (GH, K), G. Mann s.n. (K), Koelz 25499 (K), Chand 2028, 2844, 2845, 2852 (K, NY). Vietnam: Eberhardt 96 (38) (PE), S. Coll 9637 (P). Mussoorie Isl.: Colvin s.n. (K, NY). Thailand: Hennipman 3355 (KYO). Borneo: Holttum 25358 (BO, SING).

Habitat: Epiphytic or epilithic, on tree trunks or saxicolous at 400–700 m altitude.

Rhizome short, prostrate, scales light brown, lanceolate, subulate at apex, entire; laminae lanceolate, widest at below the middle portion, round-cuneate or slightly inaequilateral, cordate at base; induments dimorphic, stellate hairs dense, brown, upper layer with needle-like rays underneath covered by thinner layer of wooly rays, sometimes the upper layer deciduous and revealed grey, wooly hairs.

33. **Pyrrosia subtruncata** Ching in Bull. Chin. Bot. Soc. **1**: 67 (1935); Tard.-Blot & C. Chr., Fl. Gén. Indo-Chine **7**(2): 510 (1941); Nguyen Tu in Nov. Syst. Pl. Vasc. **18**: 18 (1981).

Pyrrosia subfurfuracea Hovenk., Monogr. *Pyrrosia* 256 (1986), p.p.

Chinese name: 截基石苇

Specimens examined. China. Guangxi: R.C. Ching 6478 (type, PE). Vietnam: Poilane s.n. (P).

Habitat: On rocks at altitude about 1500 m.

This is similar to *P. bonii*, but larger; rhizome short, lamina base subtruncate or rotundo-truncate.

34. **Pyrrosia kinabaluensis** Hovenk. in Blumea **30**: 208 (1984), Monogr. *Pyrrosia* 187. f. 23, 36 (1986).

Specimens examined. Borneo: Clemens 27479 (BO, GH), Meijer 673, 681, 698, 699b, 847 (BO), Iwatsuki et al. B 2128 (KYO).

Habitat: Epiphytic in deep shade at 600–1500 m altitude.

General habit of plants is very similar to *P. lanceolata*, but the induments dimorphic; two layers of stellate hairs on laminae underneath, the upper layer with boat-like rays and the lower with wooly rays.

35. **Pyrrosia stigmosa** (Sw.) Ching in Bull. Chin. Bot. Soc. **1**: 67 (1935); Tard.-Blot & C. Chr. in Fl. Gen. Indo-Chine **7**(2): 513 (1941); Holtt., Ferns Mal. 148 (1955); K. Iwats. in Amer. Fern J. **63**: 131 (1973); Ching & S.K. Wu, Fl. Xizang. **1**: 337 (1983); Satija & Bir, Polpod. Ferns Ind. 45 (1985); Hovenk., Monogr. *Pyrrosia* 252. f. 17 (1986); Tagawa & K. Iwats., Fl. Thail. **3**: 504 (1989) – *Polypodium stigmosum* Sw. in Schrad. J. Bot. **1800**(2): 21 (1801).

Niphobolus venosa Blume, Fl. Jav. Fil. 63. t. 28. f. 1, a–d (1829).

Chinese name: 柱頭石韦

Specimens examined. China. Yunnan: S.T. Li 80-1084 (KUN); Xizang: Qingzang Exped. 74-4169 (PE). Vietnam: Poilane 5593 (P). Cambodia: Pierre s.n. (BO, P). Burma: India: Togashi s.n. (TI). Sri Lanka: Bernardi 15530 (K). Thailand: van Beusekom et al. 2783 (KYO), Kai Larsen et al. 34296 (AAU, TI), Shimizu et al. 7743, 7935 (KYO), Tagawa et al. 1256, 8582 (KYO). Malaya: Henderson 19453, 22572 (BO, SING). Indonesia. Sumatra: Bartlett 7757 (US), Lorzing 11250, 15321, 16713 (BO), van Steenis 8832, 9297 (BO), H.F. Sun 79 (PE), Winkler 204 (US); Java: Backar & Posthumus 52, 187, 254, 305, 365, 552, 615, 637, 675, 755 (BO), Buwalda 7213, 7551 (BO), Mousset 95, 167 (P, PE), Posthumus 1483, 3707 (BO), Zippelius (type, L); Sulawesi: Bunnemejer 10789, 11757 (BO), Buwalda 3776 (BO), Posthumus 3505 (BO); Bali: Posthumus 3707 (BO); Borneo: Clemens 20659 (GH).

Habitat: Epilithic on rocks in broad-leaved forests at 280–1200 m altitude.

This is similar to *P. costata* but different in: rhizome elongate, scales long-acuminate, sparsely short serrate, entire at apical portion; stipes in a half length as laminae; laminae elliptic-lanceolate, cuneate and short decurrent at base, texture thick-coriaceous, usually revolute; lateral veins distinctly convex; superficial layer of stellate hairs with narrowly lanceolate rays and brown, hard, long hairs at apical central portion sparsely; sori dispersed on whole the lower surface of laminae, not restricted to the upper portion.

36. **Pyrrosia platyphylla** Hovenk. in Blumea **30**: 207 (1984), Monogr. *Pyrrosia* 222. f. 17 (1986).

Specimens examined. Borneo: Darnaedi 267 (BO), Dransfield et al. 2214 (BO), Elmer 20659 (MICH), Endert 5217 (BO), Iwatsuki et al. 974 (BO, KYO), Jaheri 302 (BO), Kato et al. 4146 (TI), Kostermans 5624, 5680a, 6047, 13308, 21403 (BO), Winkler 2736 (BO).

Habitat: Epilithic on rocks in light forests at lower elevations up to 600 m altitude.

This has long been confused with *P. costata* but differs in: rhizome elongate, scales more or less abruptly narrowed downwardly, costae in dried condition triangular in cross section, distinctly keeled, stomata superficial.

37. **Pyrrosia christii** (Gies.) Ching in Bull. Chin. Bot. Soc. **1**: 58 (1935); Hovenk., Monogr. *Pyrrosia* 164. f. 22, 23 (1986) – *Niphobolus christii* Gies., Farng. Niph. 140, 158 (1901).

Specimens examined. Borneo: Boden Kloss 19052 (BO), W.L. Chew et al. 1727 (SING), Endert 3146, 4666 (BO), Jaheri 868 (BO).

Habitat: Epiphytic in lowland forests up to about 1000 m altitude.

This is similar in appearance to a larger form of *P. lingua*, especially in having distinct lateral veins, but the stellate hairs are dimorphic and thin deciduous, upper layer with subulate rays and lower layer with wooly rays.

38. **Pyrrosia linearifolia** (Hook.) Ching in Bull. Chin. Bot. Soc. **1**: 48 (1935); Tagawa in J. Jpn. Bot. **24**: 116 (1969), **32**: 12 (1957); DeVol & Kuo, Fl. Taiwan **1**: 206 (1975); Kurata & Nakaike, Ill. Pterid. Jap. **2**: 600 (1981); Hovenk., Monogr. *Pyrrosia* 201. f. 20 b (1986); K. Iwats., Ferns F. Allies Jap. 263. pl. 178, 3–4 (1992); Nakaike, New Fl. Jap. Pterid. 700 (1992): Tsai & Shieh, Fl. Taiwan 2nd ed. **1**: 514 (1994) – *Niphobolus linearifolius* Hooker, 2nd Cent. Ferns ad t. 58 (1861); Gies., Farng. Niph. 171 (1901).

Pyrrosia linearifolia (Hook.) Ching var. *heterolepis* Tagawa, J. Jpn. Bot. **24**: 116 (1949); K. Iwats., Ferns F. Allies Jap. 263 (1992).

Pyrrosia linearifolia (Hook.) Ching f.

cristata Akasawa in Bull. Kochi Wom. Univ. **13**: 17 (1965) – *Pyrrosia linearifolia* monstr. *cristata* (Akasawa) Nakaike, Enum. Pterid. Jap. 352 (1975).

Chinese name: 織葉石韦

Japanese name: ビロードシダ

Specimens examined. China. Yunnan: Sino-USSR Exped. 5513 (type of *P. pygmaea* Ching in herb. PE); Jilin: S.X. Li et al. 1278, 5555 (PE), M. Noda et al. 154 (TI), J. Sato 10161 (TI), C.S. Wang et al. 3946, 4071 (PE), J.Z. Wang 3846 (PE); Taiwan: Gresitt 337 (K), Hancock 96 (K), T.C. Huang 1278 (TI), Oldham 54 (K), Sasaki 380112 (TI), Tanaka 249 (TI). Korea: I.C. Chung 1919, 2329 (GH), Nakai 1047, 4098, 6008, 6620, 10610, 10612, 12535, 12537 (TI), Taquet 68, 3833, 3854 (TI). Japan: numerous collections.

Habitat: Epilithic or less commonly epiphytic on tree trunks or even on roofs of houses at lower elevations.

Plants of smaller size; laminae linear, stellate hairs loose, subdimorphic, upper layer brown with erecto-patent acicular rays, lower layer white with more or less crimpy rays; sori arranged in a single row on either side of costae, usually located only above the middle portion of laminae, hidden by hairs, or sometimes arranged in two rows or distributing up to lower portion of laminae. Variety *heterolepis* from Taiwan is characterized only by broader scales and distinct areoles. *Pyrrosia pygmaea* Ching in herb. from Monghai, Yunnan, is a much smaller form; laminae only 20–30 × 1.5–2.5 mm, scales short serrate at margin, without cilia, lamina apex short acute, stellate hairs sparse, growing on rocks by streams at about 1280 m altitude.

39. **Pyrrosia similis** Ching in Bull. Chin. Bot. Soc. **1**: 56 (1935).

Chinese name: 相似石韦

Specimens examined: China. Guizhou: X.Y. He 1839, 1978 (PE), Y. Tsiang 6816 (type, PE), W.X. Xu 9, 10 (PE); Sichuan: Z.W. Yao 3031 (PE); Guangxi: Ching 5304 (PE), D. Fang 31335 (PE), F.S. Huang 1399 (PE).

Habitat: Epilithic on calcareous rocks on open slopes at 700–1200 m altitude.

Rhizome scales broadly lanceolate, acuminate at apex, usually lost the apical portion, brown, scarious, ciliate at margin; fronds monomorphic, stipes 20–25 cm long, glabrescent; laminae as long as stipes or slightly longer, 4–5 cm broad, widest at or above the midst, elliptic-lanceolate, acuminate at apex, cuneate at base, thick-chartaceous, upper surface glabrous, sparsely puncticulate and with a few stellate hairs with subulate-lanceolate rays underneath; sori distributed on a upper half of laminae underneath, distinct. Different from *P. boothii* in: laminae long-elliptic, margin slightly enrolled, texture rigid-coriaceous, lower side of laminae grey with white furfuraceous stellate hairs, powder-like or glabrescent, comparing with *P. boothii* with stellate hairs bearing multicellular stalks and long-aciculate rays; sporangia on stalks as long as capsules.

40. **Pyrrosia tonkinensis** (Gies.) Ching in Bull. Chin. Bot. Soc. **1**: 55 (1935); C. Chr. & Tard.-Blot in Not. Syst. **8**: 206 (1939); Tard.-Blot & C. Chr., Fl. Gén. Indo-Chine **7**(2): 506 (1941); Tagawa & K. Iwats. in Southeast As. St. **5**: 48 (1967), Fl. Thail. **3**: 501. f. 50-6 (1989) – *Niphoblolus tonkinensis* Gies., Farng. Niph. 144 (1901) – *Pyrrosia porosa* (Pr.) Hovenk. var. *tonkinensis* (Gies.) Hovenk. in Blumea **30**: 208 (1984), Monogr. *Pyrrosia* 229 (1986).

Chinese name: 越南石韦

Specimens examined. China. Guizhou: Cavalerie 2874 (type of *Cyclophorus vittarioides* Christ, P, PE), Esquirol 323 (P), H.Y. Hou 1807 (PE), Y. Tsiang 6851, 9202 (PE), P.S. Wang 1918 (PE); Guangxi: R.C. Ching 5354, 5358, 5598 (PE), P.S. Chiu 4909, 4969 (PE), Z.T. Li 602670 (PE); Guangdong: K. Liang 69008 (PE); Yunnan: W.M. Chu 3641, 3980, 6419, 8427, 15763 (PYU), K.M. Feng 11417 (KUN, PE), C.W. Wang 78734 (KUN, PE); Hainan: N.K. Chun & C.L. Tso 44076, 44153 (PE), S.K. Lau 3244, 3499 (PE), H.Y. Liang 63598, 65343 (PE), Shing et al. 1695, 1727 (PE), Tsang et al. 17715 (PE), W.T. Tsiang 861 (PE), C. Wang 35338, 35409, 36297 (PE). Vietnam: Petelot 3740 (P). Thailand: Tagawa et al. 9980 (KYO).

Habitat: Epiphytic or epilithic on tree trunks or on rocks in forests at 80–1600 m altitude.

Rhizome scales lanceolate, acuminate at apex, slightly serrate or subentire at margin; fronds linear, subsessile, stellate hairs in two layers, superficial one with shortly monomorphic subulate rays and bottom layer with wooly rays thicker than those of *P. porosa*.

41. **Pyrrosia laevis** (J. Sm. ex Bedd.) Ching in Bull. Chin. Bot. Soc. **1**: 52 (1935); Satija & Bir, Polypod. Ferns Ind. 41 (1985); Hovenk., Monogr. *Pyrrosia* 190. f. 21b (1986) – *Niphobolus laevis* J. Smith ex Bedd., Ferns S. Ind. ad pl. 161 (1868).

Chinese name: 平滑石夷

Specimens examined. China. Yunnan: China-USSR 7935 (KUN), W.M. Chu 19024 (PE, PYU), K.M. Feng 5114 (KUN, PE), C.W. Wang 83363 (KUN, PE). India: G. Mann s.n. (K). Burma: Topping 6330 (GH).

Habitat: On rocks in forests up to 1250 m altitude.

Smaller plants; rhizome slender, long-creeping, scales small and narrow, lanceolate, short acuminate at apex, light brown, entire, peltate; fronds monomorphic, with short stipes; laminae lanceolate or ovate-lanceolate, widest at below the middle portion, acuminate at apex, rounded or cuneate at base; lateral veins obvious; induments dimorphic, stellate hairs on lower layer with whitish wooly rays, those on upper layer with brown acicular rays and usually with long, dark brown, dosal spines; sori always apical; spores verrucose.

42. **Pyrrosia bonii** (Christ ex Gies.) Ching in Bull. Chin. Bot. Soc. **1**: 67 (1935); C. Chr. & Tard.-Blot in Not. Syst. **8**: 204 (1939); Tard.-Blot & C. Chr., Fl. Gén. Indo-Chine **7**(2): 510. f. 60, 2–4 (1941) – *Niphobolus bonii* Christ ex Gies., Farng. Niph. 120 (1901).

Pyrrosia subfurfuracea Hovenk., Monogr. *Pyrrosia* 256 (1986), p.p.

Chinese name: 波氏石夷

Specimens examined. China. Guangxi: R.C. Ching 5432, 6478, 7468 (PE), S.Q. Cheng 13141, 13384 (KUN, PE), C. Huang 43339 (KUN, PE), Z.T. Li 602636 (PE); Guichou: Cavalerie 2875 (P, PE); Guangdong: K.K. Tsoong 1833 (PE). Vietnam: H. Bon 2820 (type, P; PE).

Habitat: On rocks in forests at 300–1000 m altitude.

Rhizome short elongate, scales subulate-lanceolate, entire, with tufted hairs at apex; fronds contiguous, stipes slender, as long as or longer than laminae; laminae oblong- or elliptic-lanceolate, short acute at apex, cuneate at base, 3–5 cm wide, thinner in texture, lateral veins indistinct; upper surface of laminae glabrous, less puncticulate, lower surface covered with two layers of stellate hairs, superficial layer sparsely covered with brown, long-subulate rays, bottom layer with white wooly rays.

43. **Pyrrosia pseudodrakeana** Shing in Acta Phytotax. Sin. **31**: 81, 571 (1993), Vasc. Pl. Hengduan Mts. **1**: 170 (1993).

Pyrrosia intermedia Shing in Amer. Fern J. **73**: 78 (1983), non Goy 1937.

Chinese name: 凝毡毛石夷

Specimens examined. China. Sichuan: numerous specimens, and K.Y. Lang et al. 1709 (type, PE), Shing & Lang 665 (PE); Shaanxi: B.Z. Guo 527 (PE); Gansu: K.M. Liou 10494 (PE); Hubei: G.X. Fu 731 (type of *P. intermedia*, PE); Guangxi: Y.K. Li 365 (type of *P. subcordata* Ching in herb. PE).

Habitat: Mostly epilithic, but sometimes epiphytic at about 1000–2300 m altitude.

Stellate hairs on the laminae underneath are without multicellular stalks and appressed, with narrowly lanceolate rays which are neither acicular like in *P. drakeana* nor boat-shaped as in *P. sheareri*. The lamina margin is often irregularly lobate. This may be originated through hybridization.

44. **Pyrrosia nummulariifolia** (Sw.) Ching in Bull. Chin. Bot. Soc. **1**: 47 (1935); Holtt., Ferns Mal. 144. f. 59 (1955); Copel., Fern Fl. Philip. **3**: 475 (1960); Satija & Bir, Polyp. Ferns Ind. 38 (1985); Hovenk., Monogr. *Pyrrosia* 214. f. 23 (1986); Tagawa & K. Iwats., Fl. Thail. **3**: 494 (1989) – *Acrostichum nummulariifolium* Sw., Syn. Fil. 191, 419. t. 2. f. 1 (1806).

Acrostichum obovatum Blume, Enum. Pl.

Jav. **2**: 102 (1828) – *Pyrrosia obovata* (Bl.) Ching in Bull. Chin. Bot. Soc. **1**: 47 (1935).

Cyclophorus nummulariifolius (Sw.) C. Chr. var. *rufa* v.A.v.R. in Bull. Dept. Agric. Ind. Neerl. **21**: 8 (1908) – *Pyrrosia nummulariifolia* (Sw.) Ching var. *rufa* (v.A.v.R.) Ching in Bull. Chin. Bot. Soc. **1**: 47 (1935).

Chinese name: 銭币石苇

Specimens examined. China. Yunnan: W.M. Chu 3642, 6625, 15697, 15768 (PE, PYU). India: Bhutan: Bartholomew & Boufford 3793 (GH, TI). Burma: Dickason 8016 (US). Thailand: Iwatsuki et al. 8503 (KYO), Shimizu et al. 7896 (KYO), Tagawa et al. 4513 (KYO). Borneo: Elmer 20909 (MICH). Philippines: Copeland 1594 (TI), Elmer 11303, 14234 (MICH). Sumatra: Jacobs 8407 (BO).

Habitat: Epilithic on rocks at 400–950 m altitude.

Rhizome slender, creeping, bearing two rows of dimorphic fronds with very short stipes; sterile laminae suborbicular, cordate or rounded at base; fertile laminae lanceolate, obtuse or moderately acute at apex, cuneate at base; texture fleshy, upper surface of laminae unpunctate, covered by sparse stellate hairs with aciculate rays, stellate hairs on lower surface of laminae in two layers, superficial layer with long stalks and brown acicular rays, fluffy, bottom layer with white, sparse, wooly rays; some plants with oblong sterile laminae are named *P. obovata* or as a variety of this species.

45. **Pyrrosia borneensis** (Copel.) Shing in Amer. Fern J. **73**: 78 (1983) – *Cyclophorus borneensis* Copel. in Philip. J. Sci. **12** C: 64 (1917).

Pyrrosia rasamalae (Racib.) Shing sensu Hovenk., Monogr. *Pyrrosia* 233 (1986), p.p.

Specimens examined. Borneo: Clemens 26984, 27327, 27479, 33229 (BO, GH), H.F. Sun 198 (PE), Holttum 25358 (BO, SING).

Habitat: Epiphytic at 1000–1500 m altitude.

Similar to *P. rasamalae* (Racib.) Shing in habit and induments and differs from it in: rhizome scales subulate-lanceolate, with long cilia at margin and apex.

46. **Pyrrosia stenophylla** (Bedd.) Ching in Bull. Chin. Bot. Soc. **1**: 55 (1935); Dixit, Cens. Ind. Pterid. 56 (1984); Satija & Bir, Polyp. Ferns Ind. 51 (1985) – *Niphobolus fissus* Bl. var. *stenophyllus* Bedd., Suppl. Handb. 92 (1892) – *Pyrrosia porosa* (Pr.) Hovenk. var. *stenophylla* (Bedd.) Hovenk. in Blumea **30**: 208 (1984), Monogr. *Pyrrosia* 230 (1986).

Pyrrosia tibetica Ching in Lingnan Sci. J. **21**: 34 (1945); Ching & S.K. Wu, Fl. Xizang. **1**: 338. f. 4–6 (1983); Shing, Vasc. Pl. Hengduan Mts. **1**: 171 (1993).

Pyrrosia tibetica Ching var. *angustata* Ching in Lingnan Sci. J. **21**: 34 (1945); Shing, Vasc. Pl. Hengduan Mts. **1**: 171 (1993).

Pyrrosia linearis Ching & S.K. Wu, Fl. Xizang. **1**: 340. t. 89. f. 1–3 (1983).

Chinese name: 狭葉石苇

Specimens examined. China. Yunnan: K.M. Feng 24292 (KUN), P.Y. Mao 00471 (KUN), T.T. Yu 19928 (type of *P. tibetica* var. *angustata*, PE; KUN), 20530 (KUN, PE), 20861 (type of *P. tibetica*, PE; KUN); Xizang: many collections, Y.T. Zhang et al. 723, 864 (type of *P. linearis* Ching & S.K. Wu, PE). Burma: Kingdon-Ward 18976 (K), Kanai et al. 11359 (TI). Nepal: Fleming 1511, 1517, 2159 (K), many collections by Hara et al. & Kanai et al. (TI). Bhutan: Griffith s.n. (K), Kanai et al. 5360, 7174, 9269, 11111, 11359, 13908 (TI). Sikkim: Hara 6300156 (TI). India: Chand 3300 (K), Hara et al. 2144, 30148 (TI), Koelz 26466, 26469, 27169, 27170 (K), Ohashi et al. 725609 (TI).

Habitat: On tree trunks or on wet rocks in shade at 1800–2200 m altitude.

Closely related to *P. tonkinensis* (Gies.) Ching and different from it in: laminae belt-like, 30–50 cm long, 1–2 cm wide, usually decurrent towards base, subsessile, chartaceous in texture, margin often enrolled in lower portion; induments much thinner; sori sparsely distributed; sporangia sessile or with short stalks.

47. **Pyrrosia albicans** (Bl.) Ching in Bull. Chin. Bot. Soc. **1**: 72 (1935); Hovenk., Monogr.

Pyrrosia 153. f. 24 (1986), p.p. – *Niphobolus albicans* Blume, Enum. Pl. Jav. 107 (1828).

Specimens examined. Java: Alston 12459, 12786 (BO), Backer 372, 3607, 10882, 11352, 12258, 12356 (BO), Backer & Posthumus 23, 75, 168, 368, 555 (BO), Forbes 1003 (K, PE), Mousset 81 (P), Palmer et al. 774 (US), Posthumus 209, 1750, 1770, 1807, 2884, 3711, 3796 (BO), Raciborski 133 (BO), H.F. Sun 1941, 7018 (PE). Sumatra: Brooks 15833 (BO), Forbes 2547b (K), A. Joeb 329 (US), van Steenis 3884 (BO). Bali: Posthumus 3711, 3693 (BO), van Steenis 8010 (BO). Flores: Posthumus 3216 (BO), Rensch 1525 (BO).

Habitat: On tree trunks or on rocks between 700–1500 m altitude.

This species is different from *P. floccigera* (Bl.) Ching in its thick rhizome covered with fluffy and persistent scales; scales ovate-lanceolate, widest at above the attached point.

48. **Pyrrosia rasamalae** (Racib.) Shing in Amer. Fern J. **73**: 78 (1983); Hovenk., Monogr. *Pyrrosia* 233. f. 23 (1986), p.p. – *Polypodium rasamalae* Racib., Pterid. Buitenz. 99 (1898).

Niphobolus lanuginosus Gies., Farng. Niph. 190 (1901) – *Pyrrosia lanuginosa* (Gies.) Copel., Fern Fl. Philip. **3**: 472 (1960).

Specimens examined. Philippines: Edaños 20643-2 (MICH), Elmer 9042, 22255, 22325 (MICH), Merill 3820 (GH), Topping 413, 480 (MICH), Williams 683, 1476 (US). Malaya: Henderson 21697 (BO, SING), Holttum 25304 (BO, SING). Sumatra: Borssum 2080, 2274, 2322 (BO), Darnaedi 125 (BO), Holttum 28113 (BO, SING), H.F. Sun 6806 (PE), de Vogel 2927 (BO). Java: Backer 25395 (BO), Backer & Posthumus 76, 304, 369 (BO), Mousset 32, 154, 768 (P), Posthumus 76, 1536, 3555 (BO), van Steenis 2414, 11097 (BO), H.F. Sun 7014, 7114 (PE). Bali: Posthumus 3655, 3744 (BO); Lombok: Rensch 319 (BO); Sambawa: Kostermans 18281 (BO), Rensch 666 (BO); Timor: Posthumus 3209, 3372 (BO).

Habitat: Epiphytic on tree trunks at 500–1600 m altitude.

Rhizome scales peltate, fluffy, lanceolate, caudate-acuminate at apex, light brown, entire; fronds monomorphic; laminae linear, 2–10 mm wide, chartaceous in texture, usually revolute at margin; induments monomorphic, in two layers of stellate hairs on lower surface of laminae, superficial layer with brown and sparse needle rays and bottom layer with wooly rays; upper surface of laminae plane, not puncticulate.

49. **Pyrrosia floccigera** (Bl.) Ching in Bull. Chin. Bot. Soc. **1**: 71 (1935); Holtt., Ferns Mal. 147 (1955); Tagawa & K. Iwats. in South-east As. St. **5**: 49 (1978), Fl. Thail. **3**: 500. f. 50, 4–5 (1989) – *Niphobolus flocciger* Blume, Enum. Pl. Jav. 107 (1828).

Pyrrosia albicans (Bl.) Ching; Hovenk., Monogr. *Pyrrosia* 153 (1986), p.p.

Specimens examined. Thailand: Tagawa et al. 5238 (KYO). Malaya: M.-Allen 1088 (SING), Holttum 31343 (SING); Singapore: Holttum 21585 (SING). Borneo: Holttum 25358 (SING). Philippines: Elmer 22255, 22325 (MICH), Topping 413, 480 (MICH). Sumatra: Iwatsuki et al. S 1598 (KYO), Lorzing 11921 (BO).

Habitat: Epiphytic or epilithic on tree trunks or on rocks up to 3900 m altitude.

This is confused with *P. albicans* by Hovenkamp but is different from it in: rhizome slender and long-creeping, scales linear-subulate with long tails, hairy or subentire at margin, deciduous, but not broadly lanceolate, acuminate at apex, dentate at margin, fluffy, persistent as in the other species.

50. **Pyrrosia asterosora** (Bak.) Hovenk. in Blumea **30**: 208 (1984), Monogr. *Pyrrosia* 160. f. 24, 32 (1986) – *Polypodium asterosorum* Baker in J. Bot. London **18**: 214 (1880).

Specimens examined. Indonesia. Sumatra: Beccari 458 (K), Bunnemeijer 5153, 9004, 9043, 9316, 9426, 9582, 10210, 10215 (BO).

Habitat: Epiphytic on tree trunks in montane forests.

This seems to be similar to *P. lanceolata* (Alston) Morton in outline, but the rhizome scales have sheathing base extending further down from attached point and curved downwardly.

51. **Pyrrosia nudicaulis** Ching in Bull. Chin. Bot. Soc. **1**: 52 (1935); Shing, Vasc. Pl. Hengduan Mts. **1**: 170 (1993).

Pyrrosia porosa (Pr.) Hovenk. var. *porosa*;

Hovenk., Monogr. *Pyrrosia* 226 (1986), p.p.

Chinese name: 裸茎石苇

Specimens examined. China. Yunnan: Forest 10108 (type, PE), 20108, 20374 (PE), T.T. Yü 23009 (PE), C.W. Wang 19748, 64132, 65188, 69306, 69337 (PE), K.M. Feng 2639, 7093 (PE), H.T. Tsai 63012 (PE), R.C. Ching 25236, 24771 (type of *P. scolopendrium*, PE); Sichuan: C.J. Xie 40210 (PE).

Habitat: Epiphytic on tree trunks or epilithic on rocks in forests at 1600–3400 m altitude.

This is very similar to *P. porosa* (Pr.) Hovenk. var. *mollissima* (Ching) Shing but different from it in: rhizome scales ovate, short acuminate at apex, lucid, dark brown, with narrowly grey-brown and short ciliate at margin, upper surface scabrid; laminae lanceolate, gradually attenuate into stipes, upper surface glabrescent, sparsely puncticulate, lower surface with one layer of thin stellate hairs; stipes glabrous or with a few hairs. *Pyrrosia scolopendrium* is distinguished only by thinner texture of laminae and induments; probably a shady ecotype.

52. **Pyrrosia porosa** (Pr.) Hovenk. in Blumea **30**: 208 (1984), Monogr. *Pyrrosia* 25. f. 20 (1986), p.p. major; Shing, Vasc. Pl. Hengduan Mts. **1**: 171 (1993) – *Niphobolus porosus* Presl, Tent. Pterid. 200 (1836).

Niphobolus mollis et syn. honot. auct. non Kunze, 1848: Ching in Bull. Chin. Bot. Soc. **1**: 53 (1935); Tard.-Blot & C. Chr., Fl. Gén. Indo-Chine **7**(2): 506 (1941); Tagawa & K. Iwats., Fl. Thail. **3**: 501 (1989).

Niphobolus acrocarpus Gies. in Christ in Bull. Acad. Géogr. Bot. **9**: 221 (1902).

Cyclophorus alcicornu Christ in J. Bot. Paris **21**: 238, 270 (1908) – *Pyrrosia mollis* (Kunze) Ching f. *alcicornu* (Christ) Ching in Bull. Chin. Bot. Soc. **1**: 54 (1935).

Chinese name: 柔軟石苇

Following two varieties are recognized:

1(a) Rhizome scales long-ciliate; densely covered by stellate hairs on stipes to costae .... var. *porosa*

1(b) Rhizome scales lanceolate, brown, or blackish at attached point; subglabrous or with a few hairs on stipes to costae .. .. var. *mollissima*

a. var. **porosa**

Specimens examined. China. Yunnan: B.Y. Chiu 5788, 52644 (PE), W.M. Chu 2648, 8393 (YUH), W.M. Chu et al. 15501 (YUH), T.N. Liou 13001, 18975, 19375 (PE), H.T. Tsai 56369, 57283, 60126, 60907, 62453, 63012 (PE), C.W. Wang 62765, 62930 (PE), H.C. Wang 33418 (PE), S.K. Wu 4105 (type of *P. consimilis* Ching, PE; KUN; induments thinner, stellate hairs with longer rays, stipes glabrous), W.X. Xu 65 (PE); Xizang: Qingzang Exped. 6821, 7732 (PE); Sichuan: K.J. Guan et al. 3252 (PE), S.S. Kung 2468 (PE), K.H. Shing et al. 1656 (PE), L.N. Zhao 150717 (PE), Z.S. Zheng 790 (PE); Guichou: Cavalerie 140 (P), Z.S. Zhang et al. 7672 (PE); Hunan: W.T. Tsang 23649 (PE, hairs sparse); Guangxi: R.C. Ching 7172 (PE), Steward et al. 373 (PE); Fujien: N.S. Chou 285 (PE), J. He 2231 (PE); Taiwan: Masamune 1141 (TI). Nepal: Fleming 1510 (K, MICH), Hara et al. 6302045 (TI). Bhutan: Hara et al. 9010, 9269, 10067, 14669 (TI). Sikkim: Hara et al. 2134 (TI). India: Chand 3926, 4753 (K), Clarke 3104 (BO, K), Fleming 78 (K), Koelz 7399 (GH, K), Loerzing 2866 (BO), G. Mann s.n. (BO, K). Sri Lanka: Thwaites 3104 (K). Burma: Dickason F2 (GH). Thailand: Tagawa et al. T1233, 9221 (KYO), Tuyama 57401 (TI). Vietnam: Eberhardt 40 (type of *Cyclophorus alcicornu* P; PE). Laos: Poilane 26321 (P). Philippines: Curran et al. 6284 (MICH), Elmer 6297 (MICH), Sulit 5073, 82507 (MICH), Topping 1081, 1151, 1869 (MICH).

Habitat: Epilithic or epiphytic on rocks or on tree trunks at 900–2500 m altitude.

Asian botanists followed Ching in applying *P. mollis* (Kunze) Ching to the species now named as *P. porosa* (Pr.) Hovenk. until Hovenkamp (1984) corrected the name of this species: the lectotype of *Niphobolus mollis* Kunze by Ching was Zollinger 3183 which is a mixture of the collections of some species and not including the species here called *P. porosa* (Pr.) Hovenk.

This is a species variable in size and form of plants. Similar to *P. gralla* (Gies.) Ching in various features but different from it in: stipes shorter, covered with thick stellate hairs; lamina thicker in texture, revolute in dry season, upper surface puncticulate, subglabrous, lower surface covered with two layers of stellate hairs, superficial one with aciculate rays, and bottom layer with thick, wooly rays. Sometimes there are monstrous fronds with 2–3 times dichotomously forked at apex: this form is named *Cyclophorus alcicornu* by Christ.

b. var. **mollissima** (Ching) Shing, Vasc. Pl. Hengduan Mts. **1**: 171 (1993) – *Polypodium mollissimum* Christ in Bull. Herb. Boiss. **7**: 5 (1899), non Fée, 1866 – *Pyrrosia mollis* (Kunze) Ching var. *mollissima* (Christ) Ching in Bull. Chin. Bot. Soc. **1**: 54 (1935); Shing, Icon. Corm. Sin. **1**: 286 (1972).

Pyrrosia porosa (Pr.) Hovenk. var. *porosa*; Hovenk., Monogr. *Pyrrosia* 226 (1986), p.p.

Specimens examined. China. Yunnan: R.C. Ching 23303, 25236 (PE), K.M. Feng 3361, 11243 (PE), Hara et al. 318 (TI), Hancock 46 (K), Iwatsuki et al. 733 (TI), B.Y. Qiu 60554, 77448 (PE), D.D. Tao 47 (PE), H.T. Tsai 55443, 60773, 60907, 62453, 62545 (KUN, PE), C.R. Wang 649, 775 (PE), C.W. Wang 71889 (leaf narrower), 71912, 74123, 77334, 86788 (PE); Sichuan: S.S. Kung 1740 (PE), D.Y. Pong 45510, 46615 (PE).

Habitat: Epilithic on rocks at 900–2100 m altitude.

Larger form of the species: laminae thinly coriaceous in texture, with thinner induments, plane when dry, with lateral veins distinct.

53. **Pyrrosia mannii** (Gies.) Ching in Bull. Chin. Bot. Soc. **1**: 55 (1935); Tagawa in Hara, Fl. East. Himal. 2nd Rep. 219 (1971); Satija & Bir, Polyp. Ferns Ind. 44 (1985); Hovenk., Monogr. *Pyrrosia* 212. f. 18 (1986); Tagawa & K. Iwats., Fl. Thail. **3**: 502. f. 50, 7–8 (1989) – *Niphobolus mannii* Gies., Farng. Niph. 107 (1901).

Niphobolus subvelutinus Christ in Ann. Cons. Jard. Bot. Genéve **7–8**: 331 (1904) – *Pyrrosia subvelutina* (Christ) Ching in Bull. Chin. Bot. Soc. **1**: 50 (1935).

Chinese name: 曼氏石韦

Specimens examined. China. Yunnan: Derris 11975 (K), Z.G. Xu 4765 (type of *P. rufovillos* W.M. Chu in herb. PYU), Y.C. Xu 483 (PE); Xizang: Y.T. Zhang & K.Y. Lang 3244, 3246, 3248, 4427 (PE). India: Clarke 8738c (BO, K), Hara et al. 2179–81 (TI), Kanai et al. 725824 (TI). Sikkim: Hara 2182–2185, 6300 (TI). Nepal: Hara et al. 6304949 (leaf long and narrow), 6304951, 6304955, 6304956 (TI), Kanai et al. 25057, 26056, 724554 (broader leaf), 725065, 725394, 725780 (TI), Namba et al. 41 (TI, laminae narrow, irregularly lobed), Ohashi et al. 771534, 771726 (TI), Ohba et al. 8310059, 8320089, 8350084, 8580019, 8580768, 8581510 (TI), Tabata et al. 11072, 11489 (KYO). Bhutan: Griffith s.n. (K), Hara et al. 2075 (TI, margin irregularly lobed), Murata 10102 (TI). Thailand: Hansen et al. 10892, 12932 (KYO).

Habitat: Epiphytic on tree trunks at up to 1200 m altitude.

Rhizome short, not grooved ventrally, phyllopodia contiguous, scales pseudopeltate, lanceolate, long-acuminate, brown, entire; fronds monomorphic, short stipitate, elliptic-lanceolate, widest at or above the middle portion, narrowed towards both ends, long decurrent at base, with short and densely hairy stipes or sessile, upper surface distinctly puncticulate; induments dense, dimorphic, stellate hairs of superficial layer with brown aciculate rays and bottom layer with white frizzy, visible, wooly rays.

54. **Pyrrosia boothii** (Hook.) Ching in Bull. Chin. Bot. Soc. **1**: 66 (1935); Tagawa in Hara, Fl. East. Himal. 2nd Rep. 219 (1971); Dixit, Cens. Ind. Pterid. 53 (1984); Satija & Bir, Polypod. Ferns Ind. 48 (1985); Hovenk., Monogr. *Pyrrosia* 162 (1986), p.p. – *Polypodium boothii* Hooker, Sp. Fil. **5**: 52 (1863).

Specimens examined. Bhutan: Hara et al. 11309 (TI), Kanai 5359, 11309 (TI). India: Levinge s.n. (K).

Habitat: Epilithic or epiphytic at middle elevations.

Rhizome scales lanceolate, acuminate at apex, sparsely dentate at margin, attached at a little below the very center; laminae elliptic-lanceolate, length/width proportion about 3:1, acute or acuminate at apex, cuneate at base; petioles slightly shorter than laminae; induments dimorphic, stellate hairs of upper layer with acicular rays, those in lower layer with wooly rays.

Hovenkamp (1986) recorded this species from China; he considered that *Pyrrosia fengiana* Ching and *P. latifolia* Ching & S.K. Wu were identical with *P. boothii* (Hook.) Ching; Hovenk., Monogr. *Pyrrosia* 258 (1986); von Rosthorn 1707 might be from eastern part of Xizang, just adjacent to Sichuan.

55. **Pyrrosia pannosa** (Mett. ex Kuhn) Ching in Bull. Chin. Bot. Soc. **1**: 58 (1935); Hovenk., Monogr. *Pyrrosia* 217. f. 20 b (1986) – *Polypodium pannosum* Mett. ex Kuhn in Linnaea **36**: 141 (1869).

Specimens examined. Sri Lanka: Thwaites 1294 (type, K).

Habitat: Epilithic on rocks or terrestrial in forests at low altitudes.

This is similar to *P. heteractis*, but hydathodes are distinct, induments are dimorphic: the stellate hairs of upper layer with uniformly aciculate rays and of lower layer with wooly rays.

56. **Pyrrosia gardneri** (Mett.) Sledge in Bull. Brit. Mus. (Nat. Hist.) Bot. **2**: 134 (1960); Nayar & Kaur, Comp. Bedd. Handb. 81 (1974); Hovenk., Monogr. *Pyrrosia* 184. f. 21 b (1986) – *Polypodium gardneri* Mett., Farng. Polypod. 129 (1856).

Specimens examined. Sri Lanka: Waas 56461 (K), Fosberg 57274 (US), Faden 76/334 (K), Layalla 112 (K), Thwaites 988 (K), Wall 48/293 (K).

Habitat: Epiphytic or epilithic at low elevations.

Rhizome with high phyllopodia, scales long-ovate, acute at apex, peltate, brown with light brown margin, irregularly ciliate; fronds monomorphic, stipitate, laminae oblanceolate, widest at above the middle, gradually narrowing towards both ends, upper surface scattered with black punctae; induments dimorphic, stellate hairs with acicular rays on upper layer and with wooly rays on lower layer; lateral veins quite distinct, much similar to *P. costata* (Pr.) Tagawa & K. Iwats.

57. **Pyrrosia fengiana** Ching in Bull. Fan Mem. Inst. Biol. Bot. **11**: 73 (1941); Shing, Vasc. Pl. Hengduan Mts. **1**: 171 (1993).

Pyrrosia latifolia Ching et S.K. Wu, Fl. Xizang. **1**: 340. f. 88, 1–3 (1983).

Chinese name: 馮氏石韦

Specimens examined. China. Yunnan: K.M. Feng 7977 (type, PE); Xizang: Qingzang exped. 5580 (type of *P. latifolia*, PE).

Habitat: On boulder under woods by bank of the Salwin River, or on tree trunks or on rocks in forests at 1650–1800 m altitude.

Rhizome short creeping, scales pseudopeltate, lanceolate, acuminate at apex, broadened at base, dark brown, long-ciliate; stipes 15–20 (–30) cm long, densely clothed with light brown deciduous stellate hairs; laminae 16–32 cm long, 4.5–10 cm broad at middle, gradually narrowing towards both ends, elliptic or broadly lanceolate, punctate with calcareous dots on upper surface, induments on lower surface dimorphic, upper layer consisting of brown stellate hairs with long needle-like rays, lower layer with grey, frizzy, wooly rays; sori confined to the upper half of laminae underneath, hidden by induments when young and appearing in maturity.

58. **Pyrrosia drakeana** (Franch.) Ching in Bull. Chin. Bot. Soc. **1**: 65 (1935), Icon. Fil. Sin. **3**: pl. 148 (1935); Shing, Icon. Corm. Sin **1**: 270 (1972); Ching & S.K. Wu, Fl. Xizang. **1**: 340 (1983); Hovenk., Monogr. *Pyrrosia* 175. f. 17 (1986) – *Polypodium drakeanum* Franch., Pl. David. **1**: 355 (1884), **2**: 161 (1888).

Niphobolus drakeana (Franch.) Diels f. *elongata* Christ ex Diels in Bot. Jahrb. **29**: 207 (1900).

Niphobolus inaequalis Christ in Bull. Soc. Bot. France **52**: mém. 125 (1905) – *Cyclophorus inaequalis* (Christ) C. Chr., Ind. Fil. 199 (1905).

Chinese name: 氈毛石韦

Specimens examined. China: widely distributed in

Sichuan, Yunnan, South Shaanxi, and Southeastern Kansu, northwards to Eastern Hubei and Southern Honan; some notable collections are; Hubei: Wilson 2629 (K); Yunnan: K.M. Feng 2380, 3413 (PE), Forrest 13119 (K), H.T. Tsai 51491, 59924, 59986 (PE), .C.W. Wang 6410, 69145 (PE); Sichuan: W.P. Fang 3966, 4539 (PE); Xizang: Qinghai-Xizang exped. 73-166 (PE); Taiwan: Bartlett 6060 (GH, K).

Habitat: On rocks or on tree trunks up to 1200 m altitude.

A narrow-leaved form of this species has been recognized as *Niphobolus inaequalis*. Based on a specimen kept in PE identified by C. Christensen, the induments of this form are found to be similar to those of typical form of *P. drakeana*.

59. **Pyrrosia subfurfuracea** (Hook.) Ching in Bull. Chin. Bot. Soc. **1**: 68 (1935); Tard.-Blot & C. Chr., Fl. Gén. Indo-Chine **7**(2): 512 (1941); Ching & S.K. Wu, Fl. Xizang. **1**: 337 (1983); Satija & Bir, Polypod. Ferns Ind. 47 (1985); Hovenk., Monogr. *Pyrrosia* 256. f. 19 (1986), p.p. – *Polypodium subfurfuraceum* Hooker, Sp. Fil. **5**: 52 (1863).

Chinese name: 絨毛石苇

Specimens examined. China. Yunnan: T.T. Yü 19960 (KUN, PE), C.W. Wang 67587 (PE), K.M. Feng 8672, 24149 (KUN, PE), P.Y. Mao 470 (KUN, PE), Z.G. He 79-0148 (KUN, PE), F. Lin & X.F. Deng 79-0903 (KUN, PE), H.T. Tsai 52342 (PE); Xizang: B.S. Li & S.Z. Cheng 1531, 1780, 2250, 2375, 4622 (PE). Burma-Assam border: Raine 1942 (K). India: Griffith s.n. (type, K). Vietnam: Hayata s.n. (TI).

Habitat: Epiphytic on tree trunks in forests at 750–1900 m altitude.

This species is similar to *P. calvata* in appearance but different from it in: rhizome scales lanceolate, long-caudate at apex, entire; lower surface of laminae greyish blue, stellate hairs dense, persistent, with short curly rays, and often furfuraceous or powder-like in maturity.

60. **Pyrrosia calvata** (Bak.) Ching in Bull. Chin. Bot. Soc. **1**: 62 (1935); C. Chr. & Tard.-Blot in Not. Syst. **8**: 204 (1939); Tard.-Blot & C. Chr., Fl. Gén. Indo-Chine **7**(2): 509 (1941); Shing, Icon. Corm. Sin. **1**: 269. f. 538 (1972) – *Polypodium calvatum* Baker, J. Bot. London **17**: 304 (1879), Ann. Bot. **5**: 89 (1891); Dunn & Tetch., Fl. Kwangtung 352 (1912).

Cyclophorus esquirolii Lév., Fl. Kouy-Tcheou 478 (1914).

Pyrrosia subfurfuracea (Hook.) Hovenk., Monogr. *Pyrrosia* 256 (1986), p.p.

Pyrrosia pseudocalvata Ching, Boufford & Shing in J. Arn. Arb. **64**: 38 (1983).

Chinese name: 光石苇

Specimens examined. China. Guangdong: S.P. Ko 51035 (PE); Guangxi: L.Q. Cheng 93296 (PE), S.K. Lau 4585 (PE), R.H. Shan 856 (PE); Guichou: Cavalerie s.n. (P); Yunnan: W.M. Chu 3306, 4763, 5139, 11533 (PE), Hancock 53 (K), T.N. Liau 18471 (PE), H.T. Tsai 53252 (PE); Sichuan: Boufford et al. 24143 (GH); Hubei: H.C. Chow 857, 1940 (PE), H.J. Li 4949 (PE), Sino-Amer. exped. 1110 (type of *P. pseudocalvata*, PE; GH), 1429, 1663 (GH, PE); Hunan: G.C. He 4938 (PE); Zhejiang: K.K. Tsoong 4531 (PE), J.X. Wang 1548 (PE); Shaanxi: G.Y. Bai 20 (KUN); Gansu: Y.Q. He 1337 (PE). Burma: Rains 1942 (K). Vietnam: Sino-Vietnam Exped. 24, 385 (KUN, PE).

Habitat: Epiphytic or epilithic on tree trunks or on rocks in forests at 400–1750 m altitude.

This species is different from *P. subfurfuracea* from the Himalayas in: laminae green and subglabrescent on undersurface, lanceolate, gradually narrowing towards both ends, decurrent at base, undersurface of laminae clothed with two layers of stellate hairs when young, hairs of lower layer consisting of grey, short, and indistinct frizzy rays, the hairs of superficial layer with brown, long-aciculate rays, deciduous, only a few brown hairs or occasionally some grey ones on stipes and leaf margin; rigid coriaceous in texture.

Pyrrosia pseudocalvata Ching was distinguished only by the feature that the fronds clothed with one layer of brown stellate hairs with aciculate rays, spores always empty or a few substantial contents in sporangia. The distribution area is limited outside of South and Southwest China, sometimes both meeting in East Sichuan; perhaps it is a geographic race and they might be treated as two subspecies.

61. **Pyrrosia splendens** (Pr.) Ching in Bull. Chin. Bot. Soc. **1**: 68 (1935); Copel., Fern Fl. Philip. **3**: 473 (1960); Hovenk., Monogr. *Pyrrosia* 251. f. 17 (1986) – *Apalophlebia splendens* Presl, Epim. Bot. 138 (1851).

Specimens examined. Philippines: Bartsch 386, 443 (US), Clemens & Bolster 348 (GH), Edaño 12585 (MICH), Elmer 13597, 15892 (MICH), Ramos 1580, 42978, 48363 (MICH), Ramos et al. 75684, 83464 (MICH), H.F. Sun 45 (PE).

Habitat: Epiphytic in forests in lower elevations.

Larger plants; rhizome scales brown, long-subulate, entire; laminae broad lanceolate, widest at above the middle portion, short acute at apex, long-cuneate and decurrent at base; upper surface covered by stellate hairs with wooly rays; stellate hairs of lower surface trimorphic, superficial layer with light brown, aciculate rays, sometimes with a dark and long dorsal spine, the next layer with wooly rays; sori densely distributed on either side of midribs near marginal portion of 2–5 mm wide. This is different from *P. princeps* only in the stellate hairs with aciculate, not lanceolate rays on upper layer and with wooly rays on bottom layer, not glabrous.

62. **Pyrrosia distichocarpa** (Mett.) Shing in Amer. Fern J. **73**: 76 (1983); Hovenk., Monogr. *Pyrrosia* 173. f. 24, 34 (1986) – *Polypodium distichocarpum* Mett. in Ann. Mus. Lugd. Bat. **2**: 231 (1866).

Specimens examined. Sumatra: Iwatsuki et al. 168 (KYO), Lörzing 5761, 6078, 7128, 7733, 8901, 9453, 13840 (BO), van Steenis 6094, 8727 (BO), H.F. Sun 6907 (PE), Yates 1577, 2503 (K). Java: de Vries 72 (BO).

Habitat: Usually epiphytic at 600–1900 m altitude.

A quite characteristic species; rhizome scales obovate-lanceolate, short dentate at margin, attached at below the widest portion; fronds monomorphic, with very short stipes; laminae long-lanceolate, widest and round-truncate or sometimes almost cordate at base; lateral veins distinct at lower surface, upper surface smooth; induments usually monomorphic, stellate hairs with acicular rays, sometimes mixed with sparsely wooly rays; sori apical, large, distinctly separated from each other and never confluent.

63. **Pyrrosia angustata** (Sw.) Ching in Bull. Chin. Bot. Soc. **1**: 49 (1935); Holtt., Ferns Mal. 143. f. 58 (1955); Morton in Contr. U.S. Nat. Herb. **38**: 339 (1974); Tagawa & K. Iwats. in Acta Phytotax. Geobot. **23**: 52 (1968), Fl. Thail. **3**: 498 (1989); Hovenk., Monogr. *Pyrrosia* 156. f. 24 (1986) – *Polypodium angustatum* Sw., Syn. Fil. 27, 224 (1806). Type: Malaya, Roxburgh (Wallich 272) – *Niphopsis angustata* (Sw.) J. Smith, Cat. Ferns 6 (1857).

Specimens examined. Sumatra: Borssum W. 1623 (BO), Kostermans 96, 138 (BO), Yates 1238, 2574 (K). Borneo: Burbidge 317 (K), Elmer 20680 (MICH), Nooteboom 4328 (TI), H.F. Sun 6930 (PE). Malacca: Cuming 372 (K). Malaya: Penang, Ando 319 (TI), Nicolson 1040 (US), Norris 998 (SING), B.C. Stone 6318 (SING); Selangor, Ando et al. 319 (TI). Singapore: Bels 265 (SING), Henderson 22780 (SING), L.B. Keng 7036 (PE, SING). Thailand: Smitinand 10914 (K), E. Smith 2006 (K). New Zealand: Philips 10083 (K).

Habitat: Epiphytic on tree trunks, or very rarely terrestrial, at edge of forests at lower elevations below 1000 m alt.

Morton (1974) discussed on the type specimen of this species that the type was not from India but from Malaya.

When J. Smith (1857) established the genus *Niphopsis* basing on this species, he recognized rigid and coriaceous laminae with large and separate sori in a single row at each side of costae. The spore ornamentation gives an additional feature to show many linear ridges, contracted at each end to an abrupt beak. The following species from the Philippines has the same spore ornamentation, although the sori are sometimes slightly connivent each other when mature. Based on these features a taxon of subgeneric rank is warranted but not generic.

64. **Pyrrosia samarensis** (Pr.) Ching in Bull. Chin. Bot. Soc. **1**: 49 (1935); Holtt., Nov. Bot. Inst. Bot. Univ. Car. Prag. 34 (1968); Price in Phil. J. Biol. **2**: 110 (1973); Hoshizaki in Bailaya **21**: 73. f. 12 (1981); Hovenk., Monogr. *Pyrrosia* 239. f. 24 (1986) – *Gyrosorium samarense* Presl, Epim. Bot. 140 (1851).

Specimens examined. Philippines: Cuming 323 (type; K, P), Edaño 3877, 3908 (MICH), Elmer 16872 (BO, MICH), Mendoza et al. 8630 (MICH), Merrill 5996 (GH), Mindoro 255 (MICH), Ramos 946 (type of *P. philippinensis* Copel., MICH), 30259 (BO, MICH), Santos 385 (MICH), Sulit 5159, 13934 (MICH), Weber 1181 (US).

Habitat: Epiphytic on tree trunks at low elevations.

Rhizome scales peltate, lanceolate, brown, with long grayish acumens, entire; fronds submonomorphic, stipes of sterile fronds nearly as long as fertile ones; fertile fronds broadly lanceolate, 20–35 cm long, 1–2 cm broad, widest near base, broadly cuneate at base, acute at apex, contracted into a beaked spike; induments dimorphic, upper surface glabrous, not puncticulate, lower surface covered with two layers of stellate hairs, superficial one brown, sparse, with aciculate rays, bottom layer white, thicker, with lanceolate, and mixed with several kinds of needle-like rays; sori usually apical, sometimes extending downwardly; spores tuberculate with ridges.

Pyrrosia philippinensis is identical with this species in habit, but the induments of Ramos 946 consist of only one layer of stellate hairs with lanceolate arms. It is not known at the moment if the superficial layer has been lost or not, as there is no such specimens available other than this.

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前報（本誌 **72**: 19－35）に引き続き，残りの42種の一覧である．この報告で新たに記載した3種のうち，2種はこの第2部で記載し，図示した．

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